

***CORONA DIVISION  
NAVAL SURFACE WARFARE CENTER***



**CORON  
A  
IUID Center**

**951.273.4624**

***MAKING SEA POWER 21 A REALITY***

# Technical Considerations for IUID Implementation

**NSWC Corona  
Product Engineering Department  
30 July 2009**

# NSWC Corona IUID Center



Implementation Assistance  
Consumer Reports  
IUID Community  
Innovation  
Training

**Our mission is to provide expertise in mission-focused lifecycle management through IUID integration.**

# Intemporaliter Singularis

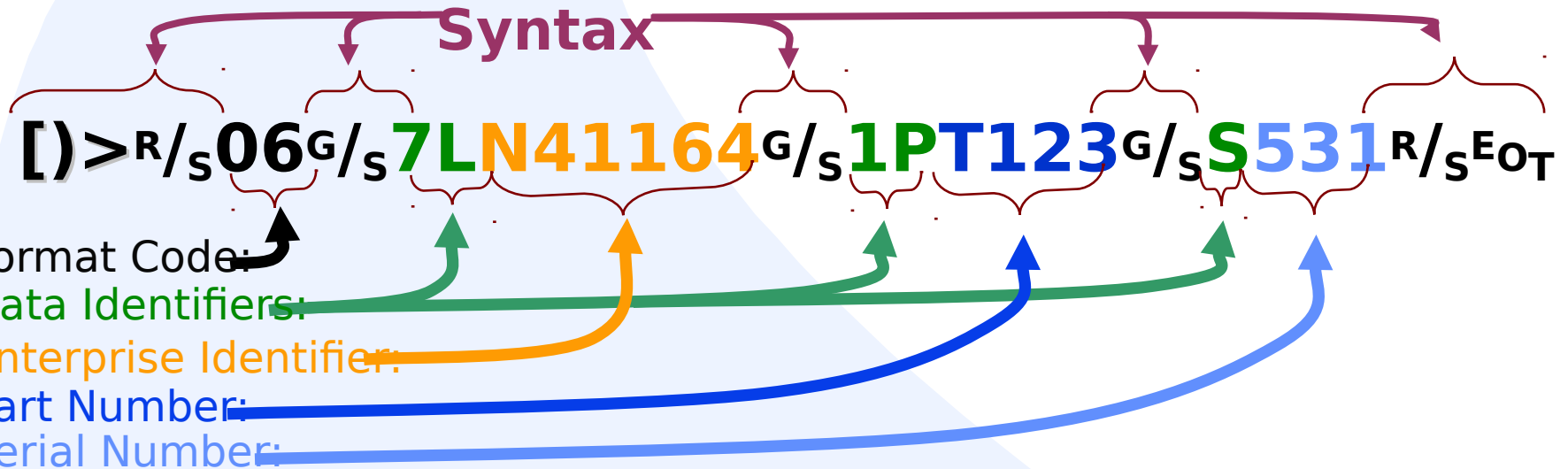
**If nothing else,  
make sure the IUID is both**

**unique**  
**and**  
**permanent**

# Turning a Data Matrix into an IUID



The right information  
encoded into the right  
kind of mark



**Unique Item Identifier (UII) : LDN41164T12**

# The Legacy Duplication Problem

## Construct #1:

[><sup>R</sup>/<sub>S</sub>06<sup>G</sup>/<sub>S</sub>255**EnterpriseID**SerialNumber<sup>R</sup>/<sub>S</sub><sup>E</sup>O<sub>T</sub>

## Construct #2:

[><sup>R</sup>/<sub>S</sub>06<sup>G</sup>/<sub>S</sub>7L**EnterpriseID**<sup>G</sup>/<sub>S</sub>1P**PartNumber**<sup>G</sup>/<sub>S</sub>S**SerialNumber**<sup>R</sup>/<sub>S</sub><sup>E</sup>

## Possible Enterprise IDs

CAGE Code

NCAGE Code

DUNS

DODAAC

GS1 Company Prefix

Must use the EID of the group  
ensuring uniqueness of the IU

(Almost always DODAAC for legacy hardware)

# Solving The Legacy Duplication Problem

## Construct #1:

[>R/\_s06G/\_s25SLD~~N641267~~SerialNumberR/\_sEoT

Obtain a new DODAAC

Use an "Enterprise" generated serial number to accompany the MFR serial number (e.g. "program code" + "database primary key")

## Construct #2:

[>R/\_s06G/\_s7L~~N641267~~G/\_sP1PartNumberR/\_sSerialNumberR/\_s

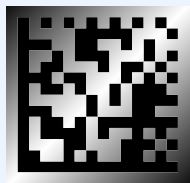
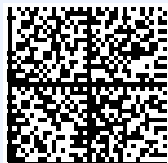
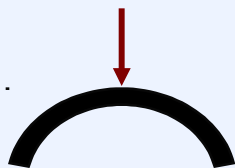
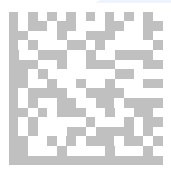
Obtain a new D

**CAUTION!**

- \*PN/SN must be unique w/in program
- \*PN/SN cannot have "special" characters
- \*PN/SN cannot be too long (42 chars)

# Readability Of The Mark

**Hard Read**



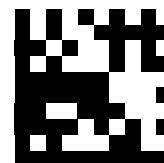
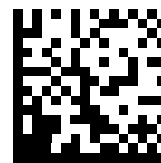
**Contrast**

**Shape**

**Cell Size**

**Reflectance**

**Easy Read**



Cheap Readers

Expensive  
Readers

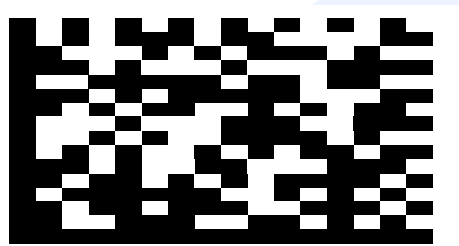
**...Verified!**



# Verification

“...the symbol shall have a minimum print quality of 3.0/05/660, ...”

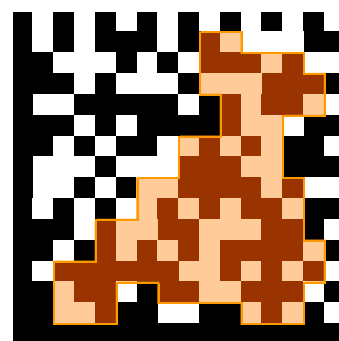
So Sayeth MIL-STD-130



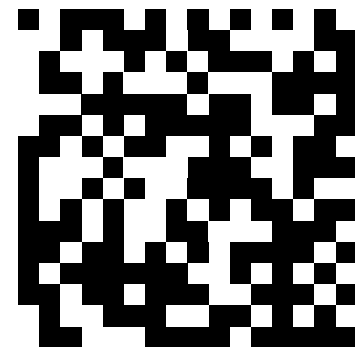
Axial  
Non-  
uniformity



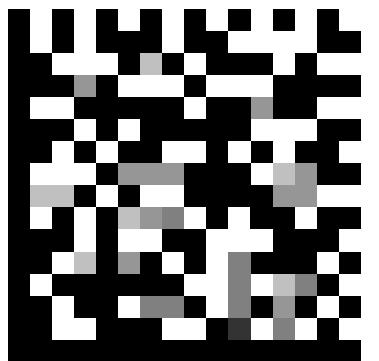
Grid  
Non-  
uniformity



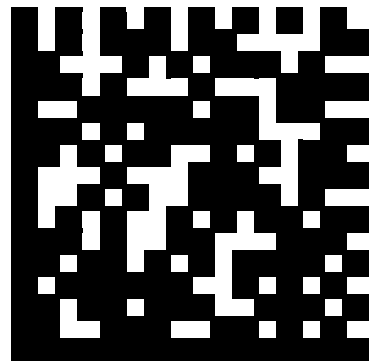
Unused  
Error Correction



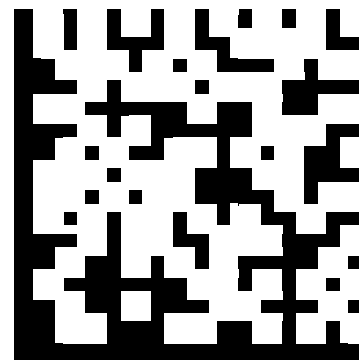
Fixed Pattern  
Damage



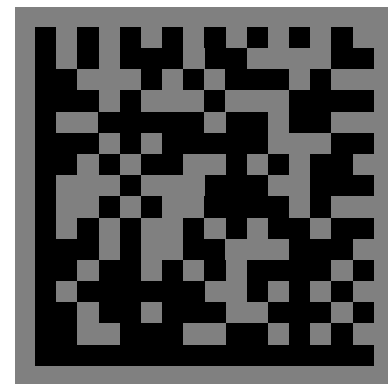
Modulation



Over-print

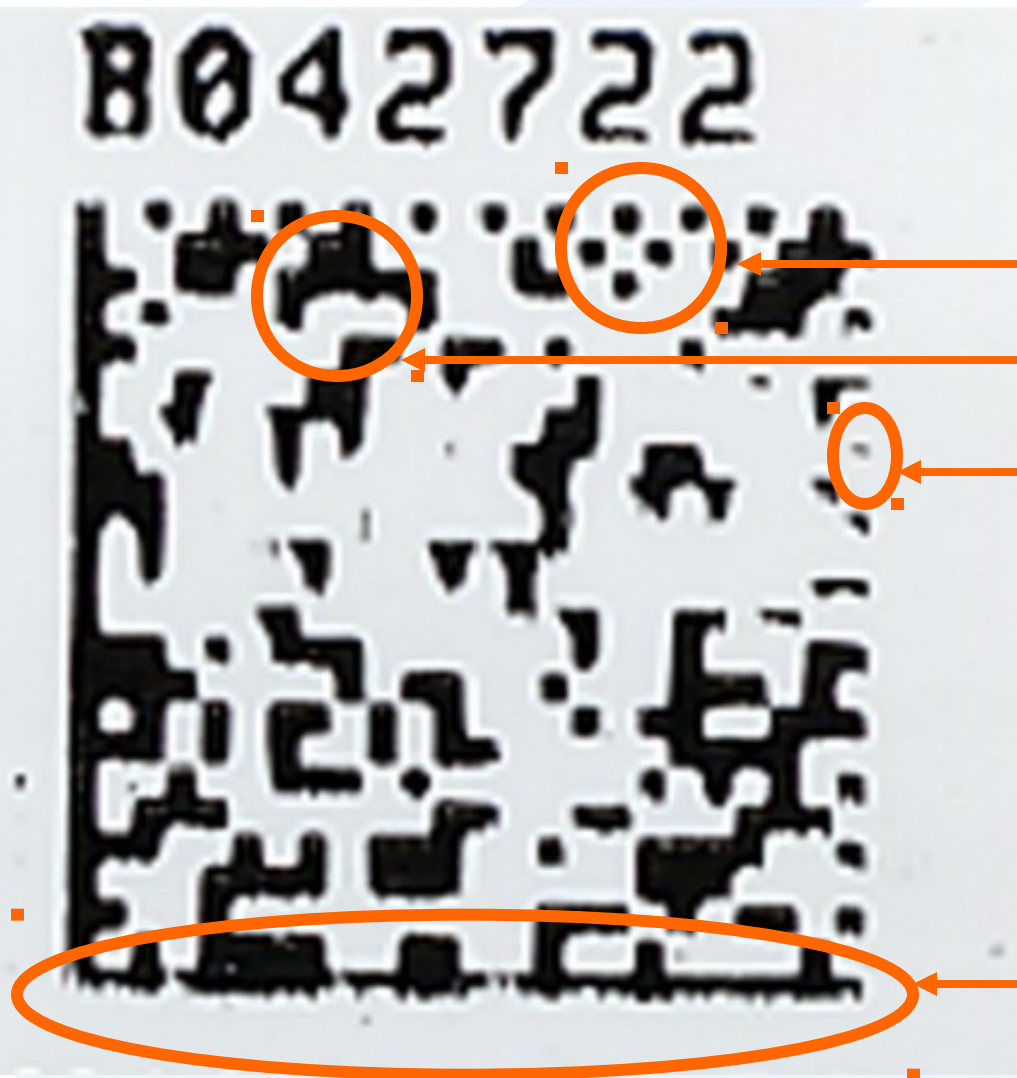


Under-  
print



Contrast

# A Readable, Failing Mark



UNDER PRINT

OVER PRINT

CLOCKING PATTERN  
DAMAGE

FINDER PATTERN  
DAMAGE

# It Starts With the Mark

## Labels



## Data Plates



## Direct Part Marking



# Top 5 Label Mistakes

- ❑ **Not protecting labels in a hydraulic fluid environment (a smudge kills a datamatrix)**
- ❑ **Using a label in an non-breathable space without engineering analysis**
- ❑ **Using labels older than 1 year**
- ❑ **Neglecting to clean hands and/or part**
- ❑ **Mismatch of adhesive or label stock to part**


# Top 4 Data Plate Problems

- ▮ **Use of aluminum plates riveted to non-aluminum metallic parts (corrosion)**
- ▮ **Over-estimating abrasion resistance**
- ▮ **Use of epoxies (thermal expansion differences)**
- ▮ **Under-estimating labor (hand cut adhesive foam)**



# Top 4 Direct Part Marking Issues

- ❑ **Engineering review often necessary**
- ❑ **Required skill level - High**
- ❑ **Part variability very hard to control/detect**
- ❑ **Contrast / Durability tradeoff**



# **QUESTIONS & ANSWERS**